

2 SPECIFICATION3 TITLE: CONTAINER WITH TAMPER RESISTANT LID4 BACKGROUND OF THE INVENTION

5 1. Field of the Invention

6 This invention relates to containers with tamper resistant
7 lids and more particularly relates to a container having a
8 tamper resistant lid with a tear strip secured by latches formed
9 on spurs on the tear strip.

10 2. Background Information

11 In recent years, package tampering has resulted in many
12 methods being conceived to protect against tampering and
13 indicate when tampering has occurred. These methods include
14 products sealing and container will make container tamper
15 evident. Any tampering with the seals on the container will be
16 readily apparent so that potential user will be warned. Present
17 methods have achieved some modicum of success but a
18 disadvantages that they are not as secure as they could be and
19 are in some cases costly to use.

20 One such container having a plastic lid has sections that
21 are easily ruptured to remove the lid. Any attempt to force the
22 lid off the container will rupture these section and provide
23 evidence of tampering. However, this system can be defeated by
24 slow, tedious prying of the lid a small section at a time, until
25 a lid is removed without rupturing the tamper evidence seal.

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1 Another method known of sealing containers is to provide a
2 heat shrinkable plastic seal around the opening and over the
3 container lid. However, this system can be defeated by warming
4 the heat shrinkable sleeve and slowly stretching it until it can
5 be easily removed. It can then be replaced and heat shrunk back
6 over the cover after the product in the package has been
7 tampered with. The container will then look like the seal has
8 remained intact.

9 Another disadvantage of the present products is that the
10 more secure they are the more difficult it is to open them and
11 gain access to the contents of the container. For example the
12 latter container with the heat shrinkable sleeve is sometimes so
13 secure that it requires a knife to cut them away. Users have
14 been injured by stabbing or cutting themselves trying to remove
15 the seal.

16 Still another method of sealing and protecting containers
17 is to provide a thin foil covering the mouth of the container
18 beneath a lid. This too, while effective, has its
19 disadvantages. The seal foil of film is covered by the lid
20 losing the visual affect of a secure package. Another
21 difficulty with this type of arrangement is that it is also
22 difficult to remove and sometimes requires a cutting instrument
23 to pierce the seal.

24 Thus it is apparent that while the present methods are
25 effective, they have disadvantages in that they can be defeated

1 or if very secure, they are difficult to remove.

2 Another method of sealing containers is disclosed and
3 described in U.S. Patent No. 5,115,934 issued May 26, 1992 to
4 the same inventor as that of the invention disclosed herein.
5 This seal has been very effective and provides a tear-away strip
6 that cannot be easily removed without evidence of tampering.
7 The tear-away strip is comprised of a plurality of tabs joined
8 by integral thin film links that are heat shrinkable. The lid
9 with this tear-away strip is mounted on a container and the tear
10 strip folded or pressed down beneath the lip of the container.
11 Heat is then applied to the strip to shrink the thin film links
12 securing the lid on a container. The thin film links are a very
13 secure method of providing evidence of tampering because it is
14 nearly impossible to remove the lid without rupturing one or
15 more of these links. However, this method of protecting
16 containers is costly and requires special machinery for mounting
17 the lids on containers. The lids must first be put on the
18 containers and rolled to fold the tear-strip down around the
19 periphery of the container and then heated to shrink the think
20 film links. Thus in addition to the cost of manufacturing the
21 lid, the method of putting the lids on the containers add to the
22 cost of the procedure.

23 It is therefore one object of the present invention to
24 provide a tamper resistant lid similar to the lid disclosed in
25 the above identified patent that is very secure. It this

1 container, a tear strip is provided that is extremely difficult
2 to remove without rupturing one or more sections of a tear-strip
3 mounted on the lid.

4 Another object of the present invention is to provide a
5 container lid that has a tear strip that is very secure but is
6 also easy to remove by a user. The tear strip is secured to the
7 lid container by placing the lid on the container and folding
8 the tear strip beneath the rim of the container to lock the tear
9 strip on the lid.

10 Still another object of the present invention is to provide
11 a tamper resistant container lid that is easy to open by using a
12 pull tab on a tear strip that allows the tear strip to be easily
13 stripped from the lid to gain access to the contents of the
14 container.

15 Yet another object of the present invention is to provide a
16 container with a tamper resistant lid that is secure, easy to
17 open and also will provide a good, secure closure after a tear
18 strip has been removed.

19 Yet another object of the present invention is to provide a
20 container with a tamper resistant lid having a tear strip that
21 is easily and quickly mounted on a container.

22 Yet another object of the present invention is to provide a
23 container with a tamper resistant lid having a tear strip with a
24 plurality of tabs around the periphery of the lid having latches
25 formed on the tabs that engage slots in a flange on the lid to

1 secure the lid on a container.

2 Yet another object of the present invention is to provide a
3 container with a tamper resistant lid having a tear strip around
4 the periphery of the lid formed with a plurality of tabs having
5 multiple latches that engage a flange on a lip of the container
6 securely fastening the lid on the container.

7 BRIEF DESCRIPTION OF THE INVENTION

8 The purpose of the present invention is to provide a
9 container with tamper resistant lids that are extremely secure
10 but may be easily removed to provide access to the contents of
11 the container.

12 The purposes of the present invention is achieved by
13 providing a lid with a tear strip secured around the periphery
14 of the lip of the container. The tear strip is secured around
15 the periphery of the lid on a lip or skirt which forms an
16 annulus for mounting the lid on the rim of a container. The
17 tear strip is secured to the periphery of the flange on the lid
18 by a thin section of material forming a hinge. Two embodiments
19 of the tear strip are disclosed herein and are improvements on
20 the method disclosed and described in U.S. Patent No. 5,115,934
21 issued May 26, 1992 to the same inventor as the invention
22 disclosed herein and is incorporated herein by reference. The
23 same secure attachment of the lid to the container is achieved
24 but without the need for the heat shrinkable links which add an
25 extra step in manufacturing and mounting the lid on the

1 container.

2 There are two embodiments conceived to replace the heat
3 melt tamper resistant tear strip called a zipper lid or Z-lid.
4 In one embodiment the lid appears to be similar but works quite
5 differently in that the tear strip hinges up instead of down and
6 protrudes through the side wall of the lid. This reverse action
7 makes contact with the lip and pulls up tighter into the lid
8 side wall when an attempt is made to remove it or pry it from
9 the cup. Also, this tamper resistant strip lid seals the inside
10 and outside of the cup to make an excellent seal. The sealing
11 surfaces still maintain an excellent seal with or without the
12 tamper resistant tear strip.

13 Because the tamper evident tear strip or band is locked
14 into place and is protected with small bumps or steps around the
15 outside edge forming latches and its reverse action to keep in
16 place, there is no need for the heat links of the zipper lid
17 between the tabs or flaps. This elimination of the heat links
18 makes the manufacturing of the lid simpler and eliminates the
19 need for a heating unit in the lid mounting or capping machine.

20 In this lid the tamper evident seal is comprised of a
21 plurality of tabs or flaps equally spaced around the periphery
22 of the lid having spurs on the underside. These tear strips are
23 attached to the lower edge of a lip around the periphery of the
24 lid with a thin section of material providing a hinge that will
25 easily fracture when a moderately lateral force is applied to a

1 pull tab on the end of tear strip. The spurs on the underside
2 of the tabs on the tear strip are constructed to engage a
3 plurality of equally spaced slots in the peripheral lip or skirt
4 on the lid and have an edge that has a plurality of steps
5 forming small bumps or latches that lock the tear strip onto the
6 peripheral lip of the lid. The tear strip is attached to the
7 lower edge of the lid with the spurs and stepped edge on the
8 outside so that the tear strip hangs downward and because it
9 hinges up instead of down is pressed into place by rolling it
10 upward.

11 In addition the lid seals both on the inside and outside of
12 the cup or container providing an excellent seal. The lower
13 inside peripheral edge of the skirt or lip on the lid has a
14 ridge that fits over a flange on the rim of the cup or container
15 and an inside surface that fits inside and engages the inner
16 periphery of the container. The lid has an annulus beneath the
17 skirt that is mounted by pressing it down guiding the container
18 into the annulus then folding the tear strip upward so that the
19 spurs and the stepped edges engage the slots in the lid. This
20 locks the tear strip in place around the periphery of the cup or
21 container. A surface adjacent the ridge in the annulus securely
22 engages an outer surface of the flange on the rim of the
23 container. These surfaces in the annulus under the lid skirt
24 provide a secure, tight seal with or without the tamper
25 resistant band or strip on the lid.

1 Another optional embodiment of the invention is a lid
2 having a tear strip similar to that shown on the zipper lid in
3 the patent referred to hereinabove in which the tear strip has a
4 plurality of tabs having a curvature that fits below the flange
5 on the rim of the container or cup and the peripheral lip or
6 skirt on the lid. Each tab preferably has a pair of spurs with
7 a detent on an edge adjacent the underside of each tab that
8 serves as a latch to engages the bottom of the lower edge of the
9 lip on the container lid to lock the tear strip in place on the
10 container. This lid also includes a peripheral ridge in the
11 annulus formed on the underside of the skirt on the lid that
12 engages a lower edge of a peripheral flange on the container as
13 well as a mating surface that engages in interior upper,
14 peripheral interior surface on the container to provide an
15 excellent seal. As in the earlier embodiment, a second surface
16 adjacent the annulus beneath the lid skirt adjacent the locking
17 ridge provides a seal against a surface on flange around the rim
18 of the container. Thus the lid maintains a tight seal both
19 inside and outside with or without the tamper resistant tear
20 strip on the container.

21 The tamper resistant tear strip is attached to the lid by a
22 thin section of material to the lower edge of the skirt
23 providing a hinge that will easily fracture when a moderate
24 lateral force is applied to a tab on the tear strip. The lid is
25 mounted on the container by pressing it down on the container

1 then rolling it in a capping or mounting machine to roll the
2 tear strip downward so that the spurs having the detents are fit
3 beneath an edge on the peripheral flange of the container until
4 the detents lock or latch on the lower edge of the flange.

5 The above and other objects, advantages, and novel features
6 of the invention will be more fully understood from the
7 following detailed description and the accompanying drawings, in
8 which:

9 BRIEF DESCRIPTION OF THE DRAWINGS

10 Figure 1 is a side elevation of a container having a tamper
11 resistant tear strip with a locking mechanism that includes a
12 spur with a plurality of steps forming bumps that engage slots
13 in the peripheral skirt on a container lid.

14 Figure 2 is a sectional view taken at 2-2 of Figure 1.

15 Figure 3 is a partial sectional view illustrating the
16 mounting of a lid on a container and engagement of the spurs on
17 the tamper evident tear strip.

18 Figure 4 is a partial sectional view of a lid having a
19 tamper evident tear strip illustrating the appearance of the
20 tear strip on the lid.

21 Figure 5 is a partial view of a lid illustrating the
22 mounting of the lid on a container by upward rotation on the
23 tamper resistant tear strip.

24 Figure 6 is a side elevation of a container having a tamper
25 resistant tear strip with a pair of spurs that have a detent

1 that engages the lower edge of a flange on a cup or container to
2 secure the lid and tear strip on the container.

3 Figure 7 is a sectional view taken at 7-7 of Figure 6.

4 Figure 8 illustrates the engagement of the tamper evident
5 tear strip when mounting the lid on a cup or container.

6 Figure 9 is a partial sectional view taken at 9-9 of Figure
7 8.

8 DETAILED DESCRIPTION OF THE INVENTION

9 One embodiment of the invention is illustrated in Figure 1
10 through 5 in which the tamper resistant or tamper evident tear
11 strip 10 is mounted on a peripheral lower edge of a skirt of a
12 container lid and is unique because it locks by folding it up
13 rather than down. Tamper evident tear strip 10 is shown on lid
14 12 mounted on cup or container 14. Tamper resistant tear strip
15 10 is separated into a plurality of equal spaced and equal sized
16 tabs 16 having spurs or lugs 18 on one side for engaging slots
17 20 in the peripheral skirt of lid 12 as will be in greater
18 detail hereinafter. Tamper resistant tear strip 10 is removed
19 from a sealed container by gripping finger pull tab 22 and
20 applying a lateral force. The arrangement shown provides an
21 easily removed tamper resistant tear strip while at the same
22 time providing a very secure lid that looks similar but works
23 quite differently from the zipper lid disclosed and described in
24 U.S. Patent No. 5,115,934 of the same inventor as the invention
25 disclosed and described herein and incorporated herein by

1 reference.

2 Lid 12 and tamper resistant tear strip 10 work quite
3 differently in that the tear strip hinges up instead of down and
4 protrudes through slots 20 in a sidewall of skirt 24 on lid 10.
5 This reverse action makes the container lip pulls hooks or
6 latches on spurs 18 tighter into the lid sidewall when any
7 attempt is made to remove it or pry it loose from cup or
8 container 14. Lid 12 also seals both to the inside and outside
9 of a cup 14 to provide an excellent seal that is effective with
10 or without the tamper resistant tear strip 10. Because tamper
11 resistant tear strip 10 is locked into place and protected with
12 small steps or bumps forming latches around an outside edge and
13 its reverse action keeps it in place, there is no need for the
14 heat shrinkable links between each tab as described in the above
15 identified patent. This simplifies the manufacturing process
16 and eliminates the need for heating when mounting lids in a
17 capping or lid mounting machine.

18 The detailed construction of lid 12 and tamper resistant
19 strip 10 is shown in greater detail in Figure 2. In this
20 figure, tamper resistant tear strip 10 is shown folded up with
21 spurs or lugs 18 engaging slots 20 equally spaced around the
22 peripheral skirt lip 24 of lid 12. Each spur or lug 18 is
23 provided with stepped surface 26. The stepped section 26 of
24 spurs or lugs 18 plus the reverse action of tear strip 10
25 cooperate with the container lip to pull the hooks formed by the

1 stepped section 26 tighter into the lid sidewall when any
2 attempt is made to remove or pry tamper resistant tear strip 10
3 and lid from cup 14. Any attempt to remove lid 12 without first
4 removing tamper resistant tear strip 10 causes hooks formed by
5 stepped section 26 to catch on the peripheral flange 28 of cup
6 or container 12 forcing the lid more tightly on the cup.

7 An additional feature of the invention is the formation of
8 a tight seal by lid 12 both inside and outside container 14.
9 Skirt 24 on lid 12 form an annulus 25 with surfaces 31 and 34
10 that mate with interior and exterior surfaces of cup or
11 container 14. Ridge 30 engages the lower edge 32 of flange 28
12 on cup 14 while an inner surface 34 in annulus 25 guides cup or
13 container 14 up into the lid and seals the container like a
14 plug. Sealing surfaces 31 and 34 on lid formed in annulus 25
15 and on peripheral straight, recessed section 36 of lid 12.

16 Tamper evident tear strip 10 is secured to lower edge 38 of
17 lid 12 by a thin web of material 40 forming a hinge. Figures 3
18 through 5 illustrate the tear strip 10 partially rolled up into
19 position for mounting the lid on a container. Spurs 18 on
20 tamper evident tear strip 10 engage slots 20 on the lip or skirt
21 of lid 12 as illustrated by the arrow in Figure 3. When
22 completely mounted on a container 14 as illustrated in Figure 2,
23 latches formed by steps in section 26 on spurs 18 fit up against
24 ridge 30 in lid beneath flange 28 of container 14. Any attempt
25 to pry lid 12 off of container 14 only serves to tighten the lid

1 on the container because of latches formed by stepped surface
2 26. Preferably each tab on tamper evident tear strip 10 has two
3 spurs 18. This provides extra security in preventing lid 12
4 from being removed from container 14 without some evidence of
5 tampering.

6 Another embodiment of a tamper evident tear strip
7 construction for mounting a lid on a container is illustrated in
8 Figures 6 through 9. A lid 50 having a tamper evident band 52
9 mounted on a container 54 is illustrated in Figure 6. Tamper
10 evident band 52 is comprised of a plurality of tabs 56 having a
11 slight curvature indicated at 58 to closely fit against an outer
12 surface of container 54. This arrangement resists any attempt
13 to get under an edge of tamper resistant tear strip. Attempts
14 to pry upwards at curved surface 58 only serves to force tamper
15 resistant tear strip more tightly on container 54. Tamper
16 evident tear strip 52 has a finger-gripping pull tab 60 on the
17 end that allows the band to be stripped from container 52 by a
18 lateral force.

19 Lid 50 with tamper evident band 52 mounted on container 54
20 is illustrated in Figure 7. Spurs or lugs 62 on each tab 56 of
21 tamper evident band 52 have a detent or notch 64 forming a latch
22 that engages the lower peripheral edge 66 of lid 50 to lock the
23 lid on container 54. Each tab 56 preferably has two spurs or
24 lugs 62 to provide extra security in holding lid 50 on container
25 54. Also tamper evident band 54 is secured to lid 50 by a thin

1 web of material 68 that will easily rupture when a lateral force
2 is applied to finger tab 60.

3 Lid 50 in this embodiment is also designed with detents or
4 notches 64 in each spur 62 to provide latches to engage the
5 lower edge of skirt 70 around the periphery of lid 50 locking
6 the lid on container 54.

7 Another unique feature as in the previous embodiment is the
8 lid is constructed to provide a secure seal both inside and
9 outside of the cup or container 54 to provide an effective seal
10 with or without tamper evident band 52. Surface 72 on lid 50
11 guides flange 74 around the rim of container 54 into annulus 76
12 beneath skirt or lip 70 on lid 50 providing a secure, tight
13 interior seal. Simultaneously interior surface 78 engages
14 surface 80 on flange 74 of container 54 also providing a secure,
15 tight exterior seal. Ridge 82 engages the lower edge 84 of
16 flange 74 on the securely retaining lid 50 on cup or container
17 54. Thus the combination of surfaces 72 and 78 in annulus 76
18 plus ridge 82 serve to provide a very secure seal inside and
19 outside cup 54 with or without tamper resistant strip 52 and
20 retain lid 50 securely on container 54.

21 The method of mounting lid 50 with tamper evident strip 52
22 on a container is illustrated in Figures 8 and 9. Lid 50 is
23 firmly pressed on cup or container 54 as illustrated in Figure 7
24 with surface 72 guiding flange 74 into annulus 76 beneath skirt
25 70 on lid 50. Tamper evident band or strip 52 is then rolled

1 downward as illustrated by the arrow in Figure 8 until spurs 62
2 having latches formed by detents 64 engage lower edge 65 of lip
3 or skirt 70 around the periphery of lid 50 beneath flange 74 on
4 container or cup 54. As shown preferably there are two latches
5 on each tab 56 providing a very secure mounting of lid 50 on cup
6 54.

7 Interior surfaces 62 and 78 in annulus 76 beneath skirt 70
8 of lid 50 provide a very secure seal both inside and outside of
9 cup 54 while ridge 82 acts to retain lid 50 on container 54.
10 The sealing surfaces 72 and 78 are unaffected and are
11 independent of tamper resistant band 52. That is, the secure,
12 tight seal both inside and outside cup 54 is maintained with or
13 without tamper resistant band 52. Because latches 64 on spurs
14 62 along with the combination of two spurs on each tab 56
15 securely latch tamper resistant band 52 in place, there is no
16 need for the heat shrinking links between tabs 56 as in the
17 patent referred to hereinabove.

18 Thus there has been disclosed an improved construction for
19 lids to seal containers with a tamper evident tear strip or band
20 that is both secure and permits an excellent seal both inside
21 and outside the cup when the band is removed. The construction
22 disclosed eliminates the need for additional heat shrinking
23 links between tabs on a tamper resistant band disclosed and
24 described in the patent referred to hereinabove.

25 In one embodiment, the tamper resistant band has a

1 plurality of tabs having spurs with a stepped edge forming
2 latches that engage a plurality of equally spaced slots in a
3 skirt or lip on the lid. This particular embodiment is unique
4 in that the tamper resistant tear strip hinges up instead of
5 down and protrudes through the sidewall of the skirt on the lid.
6 This reverse action tends to make the container skirt or lip
7 pull the hooks or latches formed by a stepped surface on spurs
8 tighter onto the lid sidewall when an attempt is made to remove
9 it from a cup.

10 A second embodiment includes a tamper resistant band having
11 a plurality of tabs with spurs on each tab having a detent
12 forming a latch that engages the lower peripheral edge of a
13 skirt around the periphery of the lid. The lower edge of each
14 tab on the tear resistant band is curved to engage the sidewall
15 of the container or cup. Each tab on the tamper resistant band
16 preferably has two spurs with detents forming latches to provide
17 a very secure attachment of lid to the cup or container. As in
18 the previous embodiment, an annulus between the skirt or lip on
19 the lid provides a pair of surfaces that mate with an inside
20 surface of the cup and an outside surface on a flange around the
21 rim of the cup to provide a very secure seal both inside and
22 outside the cup with or without the tamper resistant band.

23 This invention is not to be limited by the embodiment shown
24 in the drawings and described in the description which is given
25 by way of example and not of limitation, but only in accordance

1 with the scope of the appended claims.
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